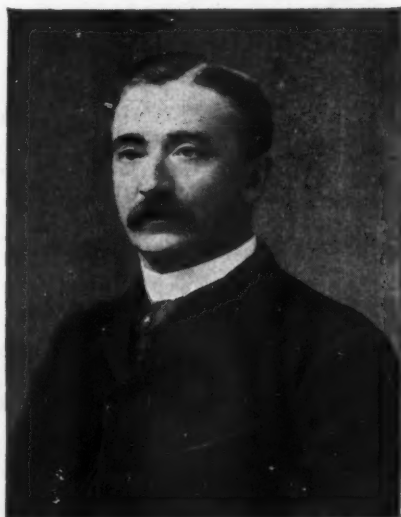


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### THE SIGNIFICANCE OF TRIFLES

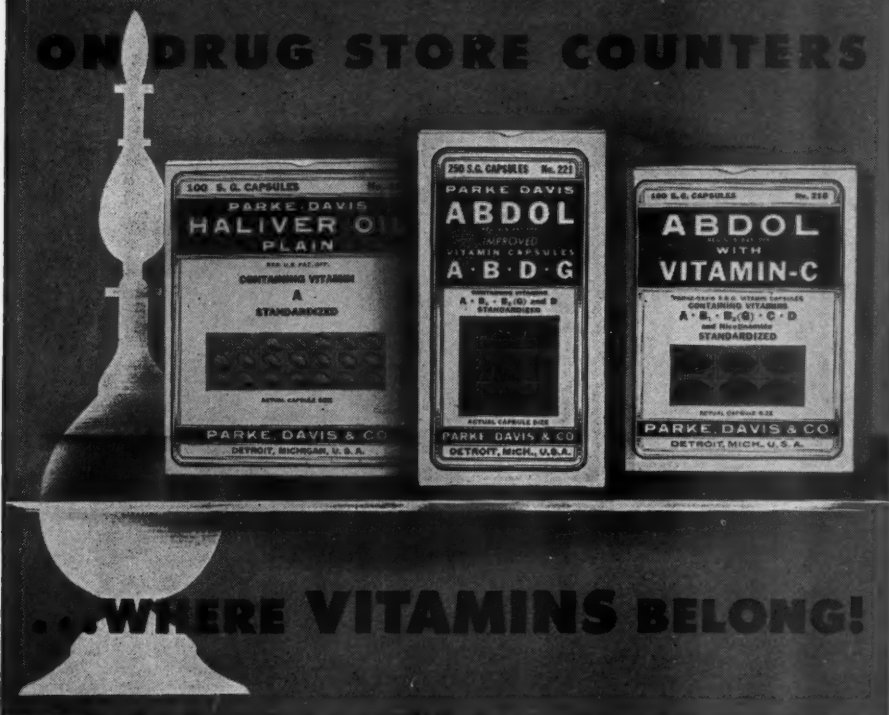
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\*Reiter, P. J., Experience with Benzedrine, Ugeskr. f. Læger, 99:459-460, 1937.



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No. 2

## CONTENTS

	PAGE
<b>Our Cover:</b>	
A Century in the Conservation of Life .....	46
<b>Editorial:</b>	
The "Front" of Pharmacy .....	47
<b>Articles:</b>	
Pharmacy and Freedom. By E. T. T. Williams.....	49
Progress in the Conquest of Pain by Anesthesiology. By John S. Lundy .....	57
Health Makes Wealth for the Americas. By Geo. C. Dunham .....	64
<b>Translated Article:</b>	
Galega. By E. U. Shass (From Russian, by E. Y. Allen)	73
<b>Economic Realities:</b>	
The Burden of Taxes! By Karl Scholz .....	76
<b>Selected Abstracts</b> .....	80
<b>Solid Extracts</b> .....	84

# O U R C O V E R

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## **"A CENTURY IN THE CONSERVATION OF LIFE"**

**O**UR cover this month carries the picture of Louis Dohme who, with his preceptor and employer Alpheus Phineas Sharp, founded the firm of Sharp and Dohme one hundred years ago in Baltimore, Maryland. The growth of this partnership into the present world-wide organization is typical of American enterprise and industry.

In 1929 the old established biological house, the Mulford Laboratories, became affiliated with Sharp and Dohme and as one organization they have grown greatly in the last fifteen years.

Sharp and Dohme is an example of productive efficiency so much a part of American pharmacy. Guns, planes, and tanks sound much more important in total war than sulfonamides, penicillin and plasma, but are they? It would be a shallow victory, indeed, if at all, were each man wounded in defense of his country doomed to suffering and probable death. And yet today's almost miraculous drugs are as important as surgical skill.

We salute our pharmaceutical manufacturers for their accomplishments and surely not least among these are those of the firm whose one hundredth anniversary we are happy to commemorate.

# EDITORIAL

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## THE "FRONT" OF PHARMACY

WE were considerably impressed by a letter coming to us recently from the Student Branch of the American Pharmaceutical Association, located at the College of Pharmacy of Fordham University. This letter was attached to a resolution signed by all of the students of that group. The resolution in effect condemned the unprofessional practice of displaying "cut-rate" signs on the exterior of pharmacies and all other signs tending to lower the professional prestige of pharmacy. We heartily endorse this resolution and commend these serious-minded young men and young women both on their sincere interest in their profession and their desire to improve its standards.

It is a queer situation indeed that some pharmacists today must be criticized by the very boys and girls who should rather revere them and strive to emulate their example. Time was when the pharmacist like the physician was held in the highest esteem by the youth, both in and out of his employ, and in that day there was no dearth of promising bright young men who sought eagerly to pursue the study of our profession.

Today it is true, of course, that the war has drained off most of our youth for Army or Navy service, but still it is a recognized fact that the pursuit of pharmacy is not as highly considered as it was a few decades past. This fact, together with the critical need of pharmaceutical personnel, has led to some extensive publicity work in the direction of stimulating interest in pharmacy as a career. Thus we have the work done by the National Pharmacy Committee on Public Information and the American Foundation for Pharmaceutical Education. The work done by these organizations is undoubtedly of value but its effectiveness is considerably reduced by the showing made in many places where the public actually sees pharmacy at close range—the retail drug store.

Many pharmacists are proud of their calling and their surroundings and conversation support this feeling. Others go out of their



way to deprecate the practice of pharmacy both by word and deed. It is small wonder that boys and girls in close contact with such individuals and their dirty, unkempt and disorderly places fail to give any consideration to pharmacy as a career.

If we who are trying so hard to improve pharmacy and the calibre of those who propose to study it are really serious, it would seem just as logical for us to take some action against those who betray us and our objectives as it is to plan and spread propaganda for the creation of a better appraisal of pharmacy by the public. Unfortunately, many of those who are responsible for the poor front we present the public cannot be reformed. We must face this fact and to believe otherwise is simple self-delusion.

The answer can only be one: first a strong American Pharmaceutical Association and then the establishment of certain minimum standards of professional conduct that are enforced by the members themselves. If we are not willing to impose self-discipline on ourselves we are not worthy of a professional rating. When the practice of pharmacy is purged of that group who constantly lower it in public esteem we shall have all those things for which we strive: good inter-professional relations, recognition in the government services, large numbers of student applicants and full public recognition. Until this is done our efforts to accomplish these results will continue to bring us the same paltry degree of success that we seem to have been achieving despite the efforts of many hard-working, sincere individuals.

L. F. TICE.





## FREEDOM AND PHARMACY <sup>1</sup>

By E. T. T. Williams <sup>2</sup>

WE can be indeed thankful that in the midst of war our daily life and routine are so little disturbed. Here we are at a Mid-Winter Reunion and Founders' Day Dinner, outwardly pretty much the same as ever—but underneath there is a difference. We think more—and more deeply.

The strain and drain of war, even here far from the fighting fronts, is great. Our sons are fighting and dying away from home. The casualty lists mount week by week. To those with sons and relatives in the Service, every day brings new hope and new fear.

War has been called a number of things, of which Sherman's definition is as good as any. And yet, war—the dreadful scourge abhorred by successive generations for thousands of years—has a beneficially dynamic effect upon humans, seldom, if ever, duplicated in time of peace.

War inspires voluntary cooperation and compels involuntary cooperation. War stimulates miracles of production, scientific development, medical and surgical research. War crystallizes ideals, transforms casual individuals through patriotism, self-sacrifice and self-preservation into men of strong character and devotion to the common cause.

Is this why some philosophers describe peace as the period between wars, giving peace second place to war in man's earthly struggle? Why do men become complacent and selfish and intolerant and ineffectual with peace? Why do civilizations rot from within during peace—as did France—needing only the first few sharp blasts of war to blow the structure down? Do not the frustrations of peace explode into war?

Why can't we avoid the horror, the bloodshed, the venality of war and have a peace that is dynamic, that stimulates voluntary cooperation, that accents character and industry and devotion to worthy ideas?

Today the United States is the most powerful nation the world has ever known—bar none. We have a military and productive power

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<sup>1</sup> Founders' Day Address, Philadelphia College of Pharmacy and Science, February 23, 1945.

<sup>2</sup> Becton-Dickinson Co., Rutherford, N. J.

that is almost incomprehensible. We have built our own military machine and manned it. And we have supplied all of our allies with material help, without which, not one of them, including Russia, would have been successful.

This great power will avail us to end the war favorably. Will it suffice to guide us safely through the years that follow the war? Not if we depend upon it alone.

In seeking to define a civilization that might last, Jacob Burckhardt, a Swiss historical philosopher, said that he found it not in power, efficiency or even patriotism, but in nations that knew and applied the lessons of their own history. He could point to many examples of power that failed—Egypt, Rome, Spain, France and others.

A perfect example of efficiency that failed is Germany. With comparatively little in the way of money, material and resources, Germany through sheer efficiency, nearly conquered the world. Germany has failed.

Patriotism? Look at Japan where patriotism is the religion of the country. Will Japan succeed?

And so, if power, efficiency and patriotism have failed, and will fail again, what can we do to preserve our position as an economic, political and spiritual force for good in the world?

And how does this problem of seeming magnitude relate in any way to an Alumni Mid-Winter Reunion of the Philadelphia College of Pharmacy and Science?

The professional and scientific aspects of any national civilization are dependent entirely on the civilization itself. The professions and the pursuit of careers in science are completely circumscribed by the human horizons of the civilization in which they exist.

According to Burckhardt, if our civilization is to live and make a worthy contribution to the world, it can do so only if we study our own history, learn its lessons and apply them to the present and the future. Is there a basic philosophical pattern in our history? Would it be commonly recognized? I think there is.

When the Pilgrim settlers came to this country, they came, generally speaking, for three reasons. To put it negatively, they came to escape religious tyranny, political tyranny or economic tyranny. They came to escape personal restraint. To put it positively, they came to worship as they pleased, to work and to save, and to have a voice in their own political destiny. They left their native lands, their fami-

lies, their early associations to make a hazardous journey over dangerous seas to a land inhabited by savages, simply because they wanted to be free. They wanted personal freedom. And when, in the case of the Pilgrims, after the first bitter winter, when half of them had died and the survivors had an opportunity to return, not a single one went back.

To them, security did not represent food, clothing, a job, or even a pension. Many of them could have had those things by remaining in their homeland. All they needed to do to get them was to change their religion or submit to some form of economic or political tyranny. To them, the only security worth having was personal freedom, and to them freedom was a very personal thing indeed.

There followed almost 150 years of confusion. It is only when we look back that history becomes over-simplified. During this period of colonial history, the Presbyterians wanted religious freedom for themselves, but they were not so sure that they wanted it for the Catholics. Neither wanted it for the Episcopalians. The Colonists who arrived early and secured land grants or acquired land through early purchase, wanted their full of economic opportunity and freedom, but they were not so sure they wanted the later arrivals to share it with them. Even political barriers to freedom arose here and there. The Colonists all wanted freedom for themselves but they were not so sure about wanting it for others. It was confusion largely induced by intolerance.

This confusion, intolerance and division of opinion melted in the heat of a common cause just prior to the Revolutionary War.

When the ministers of the churches in New England became convinced, rightly or wrongly, that the Church of England might take steps to control them, they united in preaching common opposition. There was the religious issue.

When Great Britain attempted to collect a stamp tax, the Colonists arose in wrath and rebelled against its payment. There was the economic issue.

When Parliament attempted to govern the Colonists by remote control, the challenge of non-representation was made. There was the political issue.

The three basic human desires which prompted the settlers to come here in the first place, precipitated the Revolutionary War. After the war, when our Constitution was drawn, generally described as the

greatest document ever contrived by humans for self-government, there were three million nine hundred thousand people in the United States. The great paradox of the Constitution went unnoticed. In this land of three million nine hundred thousand people, there were seven hundred thousand slaves. And so, years later, we had to fight a war to correct the paradox.

In the ensuing years, as the country became industrialized, religious freedom flared up occasionally as an issue but not to any disturbing extent. But the desire for political and economic freedom remained as dominating influences.

We in industry have experienced the impact of these desires. In the twentieth century we have seen the anti-social practices of a few corporations in a few industries precipitate legislation for the protection of labor in all industries. We have seen mass unemployment in our cities develop into a far-reaching—even over-reaching—political and economic force which to its enthusiastic supporters expresses the desire of the worker for economic freedom.

And, just as corporations, creatures of the state, in some instances restrained personal economic freedom, we now find labor unions in some instances doing the same thing. And we find the State, itself, the Federal Government assuming, for war and other purposes, powers not intended within the concept of our historical philosophy. This, too, is inciting a reaction.

And so we discover, in reviewing quickly some highlights of our own history, that the historical philosophy of our country reveals a constant search for the greatest amount of individual freedom—religious, political and economic—a search which is both selfish and altruistic. Prejudices and intolerances still confuse the issue, as they did in colonial times.

So long as this search for freedom arises from the people and its fulfilment is regulated by the people in the common interest, we are applying the lessons of the past. Whenever freedom is regulated by men in power and not by laws passed by the people, it ceases to be freedom and the character of our civilization changes, the lessons of the past are not applied, the fundamental philosophical pattern is violated.

So now let us go back and review, quickly, some highlights in the history of medicine and the related sciences to see whether, here too, lessons of the past may be applied to the present and future.

We know about Egyptian medicine.

The civilization of Egypt was largely dominated by the priests. So we find Egyptian medicine largely practiced by priests. It was a practice founded upon mystery and superstition, fear and quackery.

Medicine emerged into the daylight with the Greeks. Because theirs was a civilization which stressed the dignity of the individual, medicine flourished. The Greeks even made doctors debate in public conflicting opinions about remedies and techniques—giving the patients or victims, as the case might be, an opportunity to decide their fate for themselves.

The Greeks developed medicine to such a high plane that the Romans carried on where the Greeks left off. But when the Roman Empire collapsed, and when the vandals overran Europe, western medicine might have perished too, as did so much of western culture, had it not been for one man.

This one man happened to be free. When the lights of Europe went out for hundreds of years, when the Dark Ages dimmed much of the learning and culture and science of the western world, this one man, in the year 539, climbed a hill, lit the candle of medicine, and his followers kept it burning for six hundred years.

The man who was free built a hospital on the road from Rome to Naples. To this hospital he invited doctors from all over the Mediterranean world. They came. Patients and students followed. The doctors and students lived in the little town at the foot of the hill on which was located the hospital. This one small spot in Italy became the medical center of the world and it protected and nourished medicine through all of the Dark Ages—even in later times adding some of the teachings of Arabic medicine to its store.

The man who was free was a monk. He was free only because of the sanctuary of the church. His name was St. Benedict. His hospital was the Benedictine Monastery atop Mt. Casino. The town at the foot in which the doctors lived in their stone houses, was Salerno. When our bombers and artillery shelled the Benedictine Monastery and Salerno, we were destroying the staunch, historic haven which preserved medicine for the rest of the western world.

In the year 1240 Emperor Frederick of Sicily issued an edict of significance to medicine. Divided into five parts, it proclaimed first

—the separation of medicine and pharmacy, stating that different qualifications were needed and that the welfare of the patient was paramount. Second—that pharmacy was in effect a public health service and as such should come under public regulation. Third—that a compulsory formulary should be followed and that this should be the Salernitan Antidotarium developed by the doctors of Salerno—the pharmacopœia of the time. The last two parts of the edict never found favor and died a natural death. The fourth limited the number of pharmacists, and the fifth fixed prices by the state.

So far two significant influences of freedom upon medicine have been noted. First, that medicine received its initial impetus under the Greeks, where personal freedom was part of the philosophy and developed rapidly and scientifically under them; second, that when the findings of a thousand years might have been lost, one man, a free man, saved them.

So now let's skip to our own country where, at the time of the Revolutionary War, medicine and pharmacy were most inadequate. In this country during Colonial times, personal freedom was becoming established as a philosophy of Government and civilization—but medicine and pharmacy were lagging. Why should successful European doctors and pharmacists give up lucrative practices to share the hard lot of the Colonists. The only thing—the only thing really—that America had to offer doctors, pharmacists and scientists was freedom. Freedom and the opportunity that goes with it to become personally successful by making a contribution to the welfare of others.

And yet, look at what has happened. Starting from behind scratch—with few doctors, hardly any pharmacists, puny scientific facilities and no schools—with nothing but freedom and freedom-loving people as the base, we have built a pyramid of medicine, pharmacy, and the related professions and sciences of healing, that towers to the sky for the whole world to view and acclaim.

We have 138,000,000 people. Last year, with a war on, with 60,000 doctors in the Armed Services, more than 15,000,000 of our people were treated in hospitals. Think of it! Our chemical and pharmaceutical laboratories have supplied our needs, military and civilian and given much to the rest of the world—maintaining along with this, research and development of new products and methods. More than 17,000,000 of our people carry hospital insurance—as



against 2,500,000 in 1938. To the hospitals during 1943 went \$250,000,000 in payment of hospital care for these insured patients. Medical and surgical insurance has been initiated and increasing millions are being protected by it annually. The whole scheme of hospital, medical and surgical insurance is unfolding before our eyes and while a war is being fought.

Eleven thousand of our industrial plants have plant medical departments—six thousand are in charge of doctors; five thousand are in charge of nurses, many of these simply because they can't get doctors. The health of several million is favorably affected by industrial medicine.

The Public Health Services, Federal, State, County and Municipal, accomplish much in an overall effort to supplement private practice, fill in the chinks and give to our people needed protection and aid toward health in living.

Hundreds of charitable organizations, some national, some even international, contribute to the health of our people.

Research foundations, charitably endowed, pioneer the way to greater contributions.

Schools, laboratories, pharmacies are present in abundance and of good quality.

Health education is teaching our people better habits and better approaches to the living of a long, useful life.

Plans have been approved to increase our hospital facilities 30% when the war ceases and material becomes available.

Federal hospitalization will be increased to accommodate convalescent veterans and others permanently hospitalized.

When the war is over, more doctors, more hospitals, more laboratories will be needed to serve an America whose people will receive the finest medical and allied care this world has ever known.

Opportunities in medicine, pharmacy and the related sciences? They are legion. But these opportunities, outlined under brilliant lights on the stage of freedom can disappear—abruptly—if the curtains are ever drawn by hands neither seen nor controlled by the audience.

The future of the professions in this country will be what our political philosophy permits it to be, no more, no less.

History shows that civilizations which veer constantly to the left, even to the left of center, a favorite phrase of political phrasemakers,

describe a circular course to dictatorship and the elimination of freedom. Civilizations which incline constantly to the right will do likewise.

In either case, individuals with power somehow obtained, destroy the spirit of personal freedom and substitute in its place compulsory cooperation manipulated by force.

We are still free. Our professions and our sciences are still free. But, unless our professional men and our scientists realize that their profession, careers and opportunities are completely dependent upon the character of our national civilization—and act accordingly—they or their sons or their grandsons may some day see the curtain drawn and the light go out.

Our history indicates that our road—the good road that we have traveled thus far—does not describe a vague arc to the left or the right. It stretches straight ahead—always lighted by the desire of our people for freedom—religious, political and economic. A freedom controlled for them by laws established by them, administered by officials elected or appointed to observe the law.

If you men in pharmacy and other scientific work wish to preserve what we have and develop it to greater achievement, please do not fail to have due regard for your responsibilities as citizens. It is as a citizen, alert to the history of your country and the history of your profession that you can protect our civilization. It is as an enlightened citizen that you can help to enlighten others. This is no plea to have you become active in partisan politics. This is a plea to have you understand and fight for the fundamentals of our historical philosophy—in order that no shallow brain in any political party—no selfish pressure group or short-sighted minority or clever band of political manipulators can, during the peace that lies ahead, change for the worse the basic character of our civilization, destroy the freedom of our people, limit the opportunities of your professional and scientific endeavors—and substitute in place of all this, super-imposed immoral controls, all of which have failed eventually throughout the history of the world and to escape which most of our forebears came to this country.

What is the future of medicine, pharmacy and the related professions and sciences? What is the future of our country—our civilization? The answer is the same. The future will be directed and controlled by our free citizens—or our people will be directed and controlled by it. The choice is yours!



## PROGRESS IN THE CONQUEST OF PAIN BY ANESTHESIOLOGY <sup>1</sup>

By John S. Lundy, M. D.<sup>2</sup>

THE problem of the conquest of pain has many ramifications, since pain itself is a relative thing. Each individual reacts in his own special way to what we call painful stimuli and tolerates this distress in his own personal way. There is a type of pain, however, which is unbearable to almost anyone. That is the pain associated with surgical operations. I shall discuss only progress in the conquest of this type of pain, since it seems clear that if one can mitigate pain associated with surgical operations, other types of pain will usually be less difficult to control.

It would be well to sketch briefly some of the one hundred year history of the use of anesthetic agents as a background for realizing the present extent of the field. Long of Georgia used ether for the control of pain during operation in 1842. Wells of Connecticut used nitrous oxide for the first time for the same purpose in dental patients one hundred years ago today. Morton of Massachusetts, in 1846, made the first public demonstration of the use of ether and it was adopted immediately on a world-wide basis. The following year, in 1847, chloroform was introduced by Flourens of France and, independently, by Bell of England. In the same year, Simpson used chloroform successfully, at first principally in obstetrics. John Snow of London, the first really competent physician anesthetist, worked in this field from 1847 to 1858. In 1847 he wrote a book on ether and in 1858, he wrote the first textbook on the use of ether and chloroform, entitled, "On Chloroform and other Anesthetics." Hickman of England, in 1824, had suggested carbon dioxide for use as an anesthetic, but his suggestion was not accepted.

No important additions were made to this list of anesthetic agents for some time, although important developments were beginning to occur and later on would become important in anesthesiology. For

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<sup>1</sup> Address given before the American Pharmaceutical Manufacturers' Association, at Waldorf-Astoria, New York, December 11, 1944.

<sup>2</sup> Mayo Clinic, Rochester, Minnesota.

example, Sertürner, in 1806, presented the world with morphine, and in 1853, Wood invented the hollow needle and Pravaz the hypodermic syringe. Cocaine for local anesthesia was made available in 1884 and applied by Koller for operation on the eye. Later, ethyl chloride was used for freezing. Ore in France, in 1872, attempted intravenous anesthesia, using chloral hydrate. Spinal anesthesia was suggested by Corning of New York in 1885 and was clinically applied by Bier of Germany in 1898, by Tuffier in France in 1899 and in the same year in the United States by Matas of New Orleans. Cocaine was the agent used and left much to be desired. New local anesthetics were prepared, such as stovaine, and finally procaine in 1904. The possibilities of producing a large number of local anesthetic agents appeared to be theoretically unlimited and much progress has been made with these agents, so that today the anesthesiologist has a long list of agents, such as butyn, metycaine, nupercaine and pontocaine, which are surface anesthetics as well as injectable anesthetics.

When the sulfonamide drugs were developed, it was found that para-amino-benzoic acid inhibits the action of the drugs and therefore procaine was contra-indicated for use in cases in which a sulfonamide compound was being used. It was noted, however, that metycaine, a piperidine derivative of entirely different chemical structure, does not have an inhibiting effect on the sulfonamide compounds, so that the possibility of combating pain under a variety of circumstances was continually increasing. This progress was brought about very largely through the co-operative efforts of the pharmaceutical chemist, the manufacturing company, the laboratory investigators and the clinician. At this point, it is fair to make a prophecy that the future progress in this particular field will depend on these same groups and some fundamental principle of co-operation should be developed so that as little time as possible may be lost in developing new agents and new methods of value to the patient and all others concerned.

For a peep into the future, let us consider a problem which I am investigating at the moment. That is to use a local anesthetic and a solvent (such as water) which will contain an anti-bacterial agent. The recent development of penicillin and probably imminent development of other similar substances that may be used to counteract the effect of bacteria that are not suppressed by penicillin make it possible to visualize the utilization of these materials so that local anesthetics may be injected with little fear of infection. This would tend

to remove one of the handicaps associated with continuous caudal analgesia for obstetrics and may lead to widespread use in fields where wounds are contaminated or in unclean fields such as the throat where tonsillectomy is to be performed. At the present time, I am utilizing water with 250 Oxford units of sodium penicillin per cubic centimeter as a solvent for either procaine or metycaine. Anesthesia and relaxation are produced by it and the antibacterial effect of the penicillin is not interfered with. Epinephrine is also added to this solution in most cases and without untoward effect. The full development of this idea may not appear for some years, but it should lead to further advances in the field of anesthesiology.

The introduction of general anesthetic agents, such as ethylene by Luckhardt and Carter and independently by Brown in 1923, and cyclopropane by Lucas and Henderson in 1928 and clinically by Waters and his associates in 1933, added more of a choice of anesthetic agents and permitted the anesthetist to handle with relative safety certain unusual situations that had been difficult before. It was economically possible to utilize cyclopropane, although this agent was very expensive, through the application of a principle which had been advised by Jackson of Western Reserve University and developed clinically by Waters. This principle was to use soda lime to absorb carbon dioxide from the respired gases so that the anesthetic which is not destroyed in the body can be used over and over again, and only oxygen needs to be added, which is converted to carbon dioxide and then removed. Volatile agents, such as divinyl ether, introduced by Leake in 1930, and cyprome ether, introduced by Black, Shannon and Krantz in 1940, indicated possibilities of new volatile agents. These possibilities have not been exhausted.

The method of using the rectum or colon for the absorption of a general anesthetic goes back to the days of Pirogoff about 1847. He was unsuccessful. In 1913, the method was further developed by Gwathmey with the introduction of the use of a mixture of ether and oil for rectal anesthesia. In 1926, Butzengeiger used avertin (tribromoethanol) for rectal anesthesia. Many other agents have been given by rectum, but this method still remains to be developed by obtaining either new agents or better technics for using them.

The intravenous method of anesthesia has been gradually developed. The interesting story of this development has been told by Adams in his new book, "Intravenous Anesthesia." At the moment,

pentothal sodium seems to be the most satisfactory agent and the technic of its intermittent administration has aided its clinical introduction. This agent has been very extensively used in combat areas. Its easy portability and the fact that it is fireproof facilitate its use. The fact that its administration is easily mastered means a good deal in its application; that is, if venipuncture can be done, the administration of the drug is simply a matter of pressing on the plunger of the syringe. This is in great contrast to the manipulation of a complicated gas machine and the practice and dexterity necessary to the successful application of regional block or local or spinal anesthesia.

This brings us to a point in the progress of this field where the word "anesthesiology" should be stressed. In the past, there was a tendency for only those physicians who were inadequate for general practice of for other fields to limit themselves to the practice of anesthesia. There were so few of these that it was necessary to call on anyone else available in the locality—perhaps some passerby, but for the most part it was a registered nurse who was most readily available. At the present time, the nation finds itself woefully short of physicians who can competently administer anesthetics. Since these are divided between the armed forces and the civilian population, there is not an adequate number to care for the requirements of both. At the present time, physicians who might well be successful in other fields have chosen the field which is now known as "anesthesiology" for their profession and this points to the most rapid progress in the conquest of pain that has yet developed. This field has to do with all the activities that are associated with the administration of anesthetics, such as the use of blood and blood substitutes and the support of the patient in shock, during anesthesia and afterward, the use of stimulants in connection with support of the patient's circulation and the stimulation of his breathing and of reflex activities of his body.

The word "anesthesiology" is new and the field is also relatively new. Recently, the medical profession, as a whole, has recognized the desirability of such a field and there has been created in the American Medical Association a Section on Anesthesiology; there has been developed the American Board of Anesthesiology for the certification of physicians who are considered to be competent in this field; the American Society of Anesthetists has named its new journal "Anesthesiology"; the various medical centers and universities are beginning to utilize this word to name their departments or sections and to

indicate their instructors, and university degrees will be granted under the title of Master of Science in Anesthesiology or Doctor of Philosophy in Anesthesiology. The first Master of Science degree in Anesthesia was granted by the University of Minnesota to Dr. E. B. Tuchy in 1936.

In the field of artificial respiration, much progress has been made. In the use of oxygen, helium and carbon dioxide, much study has been carried out and these agents have proved to be useful in many fields. A great deal of investigation has been carried on under the auspices of the National Research Council and of the Army, the Navy and the Public Health Service. Many of these studies have made possible advances that, at the moment, are confidential but will be revealed when the war is over. These advances should add greatly to the facilities available to the anesthesiologist, whom we might call "the man of the future," while the term "anesthetist" might well be reserved for the man of the past.

The great advances in medical therapeutics and practice have made it possible to prepare a patient for operation and anesthesia better than ever before so that there are very few on whom operation cannot be performed if that should be necessary. The introduction of new methods of antisepsis directly and indirectly benefits this particular field of anesthesiology. The future will no doubt show anesthesiologists to what extent they must consider the administration of vitamins, amino acids and other materials in the support of patients after operation, as well as in their preparation for operation and anesthesia. The various agents used in testing the functions of various organs of the body, such as the liver and kidneys, bear directly on the choice of anesthetics, which at the moment has become very wide and makes possible the control of pain under a variety of circumstances, including operation.

Antispasmodic drugs add to the usefulness of anesthetic agents. Convulsions appearing during anesthesia may be controlled by the administration of the antispasmodic drugs, such as several of the barbiturates. Investigation as to the cause of convulsions has been carried on and gradually the various factors that probably are involved are being brought to light. Fortunately, however, anesthesiologists are able to control the convulsions and that fact gives them plenty of time to study the cause.

Treatment of shock is too large a subject to discuss, but shock must be referred to again as one of the conditions that the anesthesiologist must be prepared to deal with in order to manage properly the patients that he serves.

The utilization of anesthetics in small doses for the purpose of studying patients suffering from psychic diseases or abnormal mental conditions has not been as satisfactory as it should be, but in this field I hope for much in the future. For the control of conditions such as nausea and vomiting that may be associated with the administration of anesthetics, much has been accomplished by the utilization of certain drugs before operation and after operation. This problem might possibly lead the anesthesiologist into a study of questions of airsickness and seasickness. For those persons who suffer from insomnia, he may be able to propose a drug which will give relief. He is more likely to be able to suggest a combination of drugs which may be more useful than one drug, as there is a tendency in anesthesiology toward the utilization of small doses of several agents to accomplish a result, rather than to give a large dose of one.

Well-established facts concerning the physiology and pharmacology of anesthetics are few in comparison to what the anesthesiologist would like to have available. I am interested in a program of research which may lead to the establishment of additional facts concerning the activity of anesthetic agents. This involves the use of radio-active elements, such as radio-active carbon, hydrogen, sulfur and bromine, in the manufacture of a number of the anesthetics that have already been mentioned. It will then be possible, on administering these to an animal, to check the rate of distribution and the organs where the agent accumulates, both to produce anesthesia and to be destroyed. The decomposition products can be traced and each of these molecules can be counted. A number of technical problems are involved, as one must first obtain the radio-active elements and then include them in the anesthetic before the laboratory investigation can be begun.

Technical equipment to be used in operating rooms of the future will probably include a device by means of which the pulse may be counted with the aid of electronics and a beam of light may be projected on a scale on the operating room wall, so that any interested person in the room can immediately see exactly what the pulse rate is. This same means can be used for showing the blood pressure and also the degree of anoxemia or need for oxygen on the part of the pa-



tient. A permanent record could even be made. This would be a great help to the anesthesiologist and to all concerned. At the moment, the proposal sounds complicated but, if the method were once in use, it would soon become part of everyday life and one would wonder how we ever got along without it.

There is no time to discuss the usefulness of the anesthesiologist in resuscitation through artificial respiration, the use of blood and plasma and solutions of crystalloid materials. All of these measures are his daily practice and in a community or hospital or any similar installation, he becomes a very useful person and may be entrusted with gas therapy, such as the use of oxygen tents and the use of carbon dioxide and oxygen for the correction of post-operative hypoventilation.

Among the mechanical equipment that will be greatly improved in the future will be machines for the administration of gaseous and volatile anesthetics. It is hoped that some day parts for these machines and other equipment will become sufficiently standardized so that confusion may be avoided.

In closing, I express the hope that the war will terminate shortly, that we may all devote our full time and thought to the problem of pursuing our conquest of pain and that this conquest may be so complete that it will contribute to the prolongation of life.

## HEALTH MAKES WEALTH FOR THE AMERICAS

By Major General George C. Dunham \*

**I**T is an old saying that health makes wealth. The basic wealth of a nation is its people. The labor of a healthy, vigorous people transforms the resources of soil, mine and forest into the wealth of agriculture and industry. Out of a combination of vigorous, pioneering people and varied natural resources the Americas have accumulated riches and have achieved in this war the greatest production by agriculture and industry the world has seen.

These productive feats have been aided by improvement in Western Hemisphere health and sanitation standards, as well as by improvements in machinery and in the technique of farm, factory and mine. Wartime "wonder" developments in machines and industry have their counterparts in the advances of medicine and sanitation, too. Penicillin, sulpha drugs, new insecticides, blood banks are examples of the march of medical science. These life-giving advances of medicine contribute to victory on the economic front, as on the fighting front. After the war they will continue to pay large dividends to mankind in the way of life, health and higher living standards.

Some of the recent advances in health and sanitation work are more remote from the public eye than "miracle" drugs which capture the news headlines. Nonetheless, the achievements of health and sanitation work off the main routes of headline appeal are significant. One of the most significant of these wartime achievements is the growth of inter-American cooperation toward the end of building and elevating health and sanitation standards in the Western Hemisphere. As a model for international cooperation in combating disease, the pattern of collaboration worked out by the Americas holds hope for the future.

In this cooperative work, the Americas have recognized that there is little room for argument on the question whether disease control is an international problem. Certainly as far as the Americas are concerned, isolationism in disease control is a settled issue. That issue was settled many years ago in the organization of the Pan-American Sanitary Bureau as an inter-American agency for fighting disease and im-

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proving hemisphere sanitation. Now the principle of inter-American cooperation in health and sanitation is being carried out on a larger scale. Nineteen of the American Republics, including the United States, are working together in health and sanitation projects which have evolved out of the necessities of wartime. Under recent agreements between most of the other Americas and the United States, the work will continue for two or three years more, at least, with the Latin-American countries increasing their shares of the financing and providing an increasing proportion of the professional and technical personnel.

Brazil, for instance, has underwritten \$5,000,000 and the United States \$3,000,000 of a joint five-year program of health and sanitation work to aid the economic development of the Amazon and the Rio Doce valleys. The development of these areas is important to the continued prosecution of the war effort. The two valleys are sources or urgently needed strategic materials, including rubber, vegetable oils and minerals. Moreover, they are vast areas of potential economic development for long-range expansion hemisphere production and trade. The economic development of these areas with the aid of modern health and sanitation measures illustrates the significance of the growth of inter-American cooperation in disease control. In Brazil, health work literally is helping to make wealth for the Americas. The story is the same with cooperative health and sanitation work going on in Central America, Caribbean island republics, Peru, Ecuador, Bolivia, Paraguay, Chile and other countries.

Throughout Latin America the second World War has given impetus to economic development, to the expansion of local industries, mining and tropical agriculture. This development in substantial part has been undertaken to provide new or additional sources of essential materials for United Nations war industry. At the same time, it is the continuation of a development trend which has been moving forward for many years. With some readjustments when war production is curtailed, the development trend seems likely to continue, and to be accelerated in various lines, after the war. What holds particular promise in the future development of their natural wealth is the will toward and experience in cooperative effort achieved by the Western Hemisphere countries.

Inter-American cooperation—now a highly developed system of principles and operating mechanisms—in itself is eloquent testimony

that no nation can lift itself up the ladder of economic development and living standards by its own bootstraps. That truth, too, is implicit in international trade. In an urgent way, that elemental economic fact has been brought home to the Americas by the second World War. First the war removed from the reach of this hemisphere substantial markets and sources of supplies in Europe. Then the spread of the war to the Pacific cut off large sources of raw materials, such as rubber and fibers. The resulting increased development of hemisphere production and trade to offset these losses turned the spotlight on the mutual interdependence of the Western Hemisphere countries. Probably it is no exaggeration to say that inter-American trade and hemisphere production in these war years have undergone the greatest expansion in history for a comparably brief period. The momentum of the trend, together with the fruits of experience in inter-American cooperation, doubtless will carry forward after victory on the battle-fronts permits the Americas to concentrate again on the long-range tasks of raising civilian living standards. And in economic development tasks, health and sanitation work now has a firmly established place. The best evidence of this is the recent series of agreements between the United States and other American republics extending health and sanitation programs begun in the grim crisis following Pearl Harbor.

It was in that crisis after Pearl Harbor that the American republics enlarged the framework of inter-American cooperation to strengthen hemisphere defense and expand hemisphere production of essential war materials. This was done at the Rio de Janeiro conference of American Foreign Ministers, in January, 1942. With an Axis pincers threat aimed at Latin America by way of Africa and the Pacific, the Rio de Janeiro meeting drew a pattern of cooperative activities which since has made history in contributing to victory of the United Nations. And tucked away in resolutions calling for action in economic development and improvement of hemisphere defenses was a recommendation for health and sanitation measures to support the joint war effort.

Such was the genesis of the largest health and sanitation program yet undertaken on a cooperative basis among independent nations. The specific reasons for placing the work on a cooperative basis were manifold. First it was recognized that war would bring a great movement of defense forces, workers and others throughout the hemisphere.

This increased the menace of the spread of contagious and insect-borne diseases, such as malaria. Then it was understood that the strengthening of hemisphere defenses would mean the building of additional air, naval and military bases in areas which required health and sanitation work. Furthermore, it was understood that the development of hemisphere production of war materials largely would be centered in areas off the main lines of urban health improvements, such as the Amazon and Rio Doce valleys in Brazil, mining camps of Bolivia, fiber plantations of Central America and Haiti.

In defense and development work of the scope called for in the Rio resolutions, the vanguard had to include the doctor and the sanitary engineer. They were needed to prepare the way for soldiers, sailors, airmen, miners, rubber and fiber collectors. Hence health and sanitation measures were among the first to go into action as recommendations of the Rio conference were expressed in tangible projects. With \$25,000,000 transferred from President Roosevelt's emergency fund, supplemented later by appropriations from Congress, the Office of the Coordinator of Inter-American Affairs soon after the Rio meeting launched the health work and sent the first mission of doctors and engineers to Ecuador to start what since has become a program of continental dimensions.

The principles of cooperation behind this continental program had evolved with the inter-American system, from its earliest beginnings in the minds of such men as Simon Bolivar through Pan American Conferences and special meetings, leading to the specific recommendations of the Rio conference. It was necessary, however, to enlarge the machinery of cooperation for the health and sanitation measures. Out of the special needs of the work came a new mechanism—the Inter-American Cooperative Health Service. The special services, with some variation in operating arrangements and names, were organized as integral parts of the national governments to provide channels of cooperation with the United States. For the United States, the Coordinator's Office set up a corporate entity known as the Institute of Inter-American Affairs. This corporate entity facilitated the operations outside the United States and the handling of funds.

To the 18 Latin American countries participating in the program, the Institute of Inter-American Affairs assigned some 220 United States citizens, including 28 physicians, 58 engineers and 26 nurses.

These mainly were specialists. The overwhelming proportion of the personnel consists of nationals of the other American republics. A recent summary, for instance, showed nearly 12,000 at work in the continental program, including 269 physicians of the other Americas, 150 engineers, 108 registered nurses, and nearly 1500 other technical and clerical personnel. In addition, nationals of the other Americas included more than 1,000 practical nurses and sanitary inspectors.

Doctors, engineers and other trained personnel were selected with knowledge of the great variety of local conditions in the hemisphere and special health and sanitation programs encountered in various places. Moreover, production of strategic materials and defense projects raised peculiar disease control and sanitation problems. To handle these, cooperative arrangements were worked out with fiber growers in Haiti, the Rubber Development Corporation and the Foreign Economic Administration. In collaboration with the Brazilian government and FEA, for instance, special medical service was made available to mica miners in the Rio Doce Valley. Similarly, special projects and services were provided for workers engaged in the collection and handling of rubber, in the construction of strategic highways, mining in Bolivia, building of airports, naval bases and other hemisphere defenses.

The variety and scope of the work is indicated by a recent summary showing more than 700 activities under way or completed. These included some 300 projects for environmental improvement through permanent mosquito control measures, water supplies, sewerage systems and general sanitation. Included in the construction work were 140 health centers, hospitals, infirmaries, dispensaries and other buildings. More than 200 activities embraced provision of medical care and preventive services through the operation of hospitals, health centers, clinics and laboratories; surveys and research in disease control; local training courses in health education.

From malaria control posts in the Amazon forests to hospitals and health centers in crowded urban districts, the projects are designed to yield maximum benefit for wartime needs and to aid long-range hemisphere development. Chile, for example, has been undergoing considerable industrial expansion, centering in the capital city, Santiago. Diversification of production is one of Chile's aims to avoid economic difficulties in the event of sudden cessation of war demands for copper and nitrates, her chief exports. Chile, consequently, is

pressing for greater industrialization. Santiago is a growing industrial area. And among the cooperative health and sanitation projects in Chile is a modern health center in a workers' residential district in Santiago.

At many other points the inter-American health program touches hemisphere development. Wartime and long-range development of hemisphere resources are so closely entwined it is not possible to draw a sharp line of demarcation. Airports, highways and similar works built primarily for urgent war needs will remain after the war to aid longer-range developments. Mining, tropical agriculture, manufacturing and other fields of hemisphere economic growth likewise have been stimulated. The health work, as part of this wartime activity, cannot be distinguished sharply between projects useful only for war and projects useful for longer-range expansion of hemisphere production and trade. As illustration of the role of the health work in hemisphere economic development, the following additional specific examples are cited:

*Peru*—The Peruvian government is building highways across the Andes, encouraging colonization and agricultural projects to develop a large territory in the upper Amazon basin. The upper Amazon is one of the remaining frontiers for development in the Western Hemisphere. During the war it has become of increasing importance as a source of rotenone, rubber and other tropical products. The chief economic returns from this area, however, will come with further improvement of communications and colonization. Most of the cooperative health and sanitation projects in Peru are in this trans-Andean territory. Health centers, hospitals and other medical facilities are being provided to aid colonization and agricultural development.

*Chimbote, Peru*—This port on the Pacific coast, north of Lima, is developing to serve a potential industrial area, tied in with irrigation, hydroelectric power, mining. To assist the development, the Peruvian health service, with the aid of United States doctors and engineers, is carrying on malaria control work and constructing medical facilities.

*Inter-American Highway*—Work on the Inter-American Highway, from the United States border to the Panama Canal, has been accelerated during the war. This highway promises eventually to

become one of the great arteries of hemisphere travel and to stimulate internal economic development and trade in Mexico and Central America. Many projects in Mexico and the Central American countries have been planned with an eye to improvement of sanitation conditions along the route of the highway. This applies particularly to waterworks, health centers, malaria control.

*Bolivia*—Bolivia's economy centers in the mining areas of the high plateau. But, like Peru, Bolivia has a large area of potential economic development in the upper Amazon, providing communications and health and sanitation facilities can be improved. Airplanes and highways are bringing better communications. Now the inter-American cooperative service is building small hospitals, extending malaria control and sending trained personnel into Bolivia's Amazon country, one of the chief hemisphere sources of rubber and a potential source of other tropical products.

*Ecuador*—Ecuador has extensive undeveloped areas, especially east of the Andes, which could be developed with the aid of communications and health and sanitation work. Rubber production has been increased. Health projects in Ecuador are planned to assist general economic development, as well as for immediate war needs in the production of balsa wood, quinine, rubber. New facilities include hospitals in Guayaquil, the leading port, and Quito, the capital.

*Central America*—Ordinarily a source largely of such export commodities as coffee, bananas, and cocoa, the Central American republics have aided United Nations war industry by increasing production of fibers, rubber, cinchona bark and other forest and tropical plantation products. Extension of highways and air lines is adding vigor to economic development of these mountain-studded countries. The health and sanitation work in Guatemala, El Salvador, Honduras, Costa Rica, Nicaragua and Panama embraces mainly malaria control, construction of health centers, provision of safe water, sewerage facilities and the training of technical personnel. These activities are planned to aid long-range economic development in Central America and immediate war needs. Experimental work in tropical agriculture is being expanded, with new agricultural research and study centers opening in Costa Rica and Honduras.



*Paraguay*—This inland country, with a population of only about 1,000,000 in an area of 150,000 square miles, has long-range prospects for the development of agriculture, cattle raising and forest products, dependent partly upon improvement of health and sanitation facilities and communications. Health and sanitation work in Paraguay includes the construction of health centers in workers' districts in Asuncion, the capital; health education; study of waterwork needs.

*Amazon Valley*—This vast area, two-thirds the size of the United States, has come into the spotlight during the war for its rubber, vegetable oils and strategic position on international air routes. Air transport is aiding economic development of the valley. Brazil is encouraging colonization in the Amazon. Manaus, 1000 miles up the Amazon, and Iquitos, Peru, more than 2000 miles upstream, seem likely to become important points on hemisphere air routes. The immense forests in the Amazon Valley, besides rubber, hold incalculable quantities of vegetable oils, hardwoods, nuts and other tropical products. With better communications, and improvement of health facilities and food production, the Amazon may be expected to make faster economic progress. In recognition of this, the inter-American cooperative health service in Brazil has an extensive program of malaria control, training of technical personnel, hospital construction and disease investigation. This work centers in such Amazon Valley towns as Belem, gateway to the valley at the mouth of the river; Santerem, Manaus, and Iquitos. The work in Brazil's Amazon area is supplemented by projects in Amazon sections of Bolivia, Peru, Ecuador, Colombia, introducing tropical medicine into the valley on the largest scale in its history.

*Rio Doce Valley*—This valley, in the heart of Brazil's chief mineral and agricultural regions, is one of the Western Hemisphere's greatest sources of minerals. Mineral resources include some of the largest iron ore deposits in the world. Rail facilities are being reconstructed to expedite economic development. Health and sanitation work is being done both for wartime needs and to aid the longer-range development of the valley. Projects include malaria control around rail construction camps, health centers, training of sanitary inspectors, health education.

*Haiti*—Haiti, one of the most thickly populated countries of the hemisphere, has increased its production of fibers for United States industry, is entering long-range development of rubber and fostering diversification of agriculture, some local production of handicraft and consumer goods. Haiti has a strategic position on Caribbean air and sea routes. Malaria control, training of personnel, control of yaws and other diseases are being carried on for immediate war needs and to aid long-range development of the country.

Just as sturdy, vigorous people are a nation's basic wealth, so the varied hemisphere health and sanitation work rests on a foundation of trained professional and technical personnel. Training of men and women in medicine, engineering, administration, technical work is one of the most effective roads to the attainment of rising hemisphere health and sanitation standards and the production of more wealth. Training is emphasized in the inter-American cooperative program. Aside from training done in the other American countries, many public health officials, doctors, engineers and specialists are being brought to the United States for study in medical schools and for observation of public health practices. More than 300 physicians, nurses, sanitary engineers and other specialists have come to the United States for advanced training. In the other Americas, hundreds of persons have received instruction in sanitation, medical and nursing services, in health education under the inter-American program.

This increase of trained medical and engineering personnel is wealth in the making. The training of professional and skilled personnel today is one of the best assurances of higher hemisphere health and sanitation standards in the world of tomorrow. When victory has been won on the battle fronts, these new continental forces of health will pursue the unending fight against disease. Victory in the ceaseless fight against disease, in turn, will mean more wealth for the Americas.



## GALEGA

(Russian Synonyms: Kozlyatnik, Rutovka)

By E. U. Shass\*

Translated by Edgard Yan Allen, M. Sc.\*\*

**G**ALEGA—*Galega officinalis* (1), Fam. Leguminosæ—is a perennial, herb-like, short-stemmed, multiple-headed (racemose), almost bare plant attaining a height of 1.5 meters. The leaves are odd-pinnate, mucronate tipped. The flower-brushes have a blue tint, are erect, and protrude from the grooves of the leaves. It grows well in rich, moist, warm soil. It is found in shady places of the wooded areas of Crimea and Kavkaz. It blooms from June to August. After blossoming this plant becomes stiff, acquires a repugnant odor and bitter taste. For medicinal purposes the herb is collected during the period when it is in bloom. In the year 1600 Galega was cultivated for medicinal purposes. (2) This medicament was used as a diuretic and diaphoretic measure; against tapeworms; as an alterative, and in diseases of the skin. At the end of the eighteenth century it was cultivated as a feed plant for cattle for the purpose of increasing the quantity of milk in cows. At the same time, according to the data of L. M. Kretchetovich, it is poisonous for goats. (4)

The active constituent of Galega appears to be the alkaloid "Galegine"  $C_6H_{13}N_3$ —isoamylenguanidine, isolated by Tanret in 1914 from the seeds of this plant in quantities of 0.5 per cent. According to Barger, galegine fully replaces guanidine. According to Madaus,

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\*\* *Translator's Notice*: Much hardship is imposed upon the population of a country during time of war. This is greatly increased in the case of individuals suffering from some prolonged illness such as diabetes, tuberculosis, etc., since the medicinals needed for the treatment of such maladies are either unavailable or cannot be transported to the area where they are needed. Such conditions, which have been created by this war, have led some of the European Nations to look for new native sources of needed medicaments.

This article, translated from a rather recent Russian Pharmaceutical Magazine Edition (i. e., PHARMATSIA or PHARMACY, Vol. I, 1944, p. 32), tends to show the type of investigational work being undertaken by our Russian ally to discover new local sources of needed drugs.

galega contains glucokynine, which, according to Meier and Gotlieb, just like certain plant extracts (from Agaric, yeast, etc.) contains hypoglykemia-producing substances which apparently have a lasting action. The action of guanidine is similar to these substances—while decamethyleneguanidine, which is dispensed under the name of "Synthalin," possesses a much stronger action. Galegine replaces Synthalin—lowering the sugar level in the blood, but to a much lesser degree than Synthalin. (3) (5) (6)

According to Reinbein, galegine appears to manifest glucose factors. Depending on the dosage, galegine manifests either hyperglykemia or hypoglykemia. (6) (9)

Partiure calls Galega "plant insulin." In Germany it is called "the poor man's Insulin." (8) According to some authors, the mechanism of the action of galegine is principally different from the action of Insulin.

Schtrnadel prescribes drinks for diabetics in the form of decoctions from the herb and seeds according to the following formula: (7)

℞	Herb. Galegæ	
	Semin. Galegæ aa	25.0 Gm.

MDS. One teaspoonful to a glass of water, boil quickly and allow to stand for ten minutes. Drink one glass 3 times a day before meals.

The following formula is also met with in literature:

℞	Herb. Galegæ	-	30.0 Gm.
	Fructus Foeniculi		10.0 Gm.

MDS. Two (2) teaspoonfuls to a glass of cold water, let stand for eight (8) hours and drink in swallows during a period of one (1) day.

Meier prescribes the following for diabetes:

℞	Fol. Vaccini myrtill.	
	Herb. Taraxaci aa	20.0 Gm.
	Herb. Galegæ	40.0 Gm.
	M. f. species.	

D. S. 1-2 tablespoonfuls to a glass of water, boil and drink two (2) times a day before meals.

In addition to the use of Gelega in diabetes, there are directions for its use in skin ulcers in the form of ointments, also for cases of wet eczemas. At the present time it is important for us to investigate Gelega as an agent for the replacement of insulin.

It is imperative to collect a sufficient quantity of Galega herb and seeds for experimentation and to widen the clinical investigations regarding its use.

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## **ECONOMIC REALITIES**

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### **THE BURDEN OF TAXES!**

**By Karl Scholz, Ph. D.\***

**F**EW people, if any, enjoy paying taxes. Since taxes are compulsory payments of income to a governmental agency from which no specific benefits are derived, they are commonly regarded as a burden. Their imposition seemingly does violence to the taxpayer's freedom of choice in the disposal of his income, for he has only a receipt to show for what he has been compelled to pay,—and not always that!

Because of this popular aversion to the payment of taxes it would seem appropriate to inquire a little into the nature and functions of taxes. A better understanding of these matters might go a long way in changing somewhat the prevailing attitude that taxes are a burden, and make us view them rather as the necessary cost payments for the various services of government.

Ordinarily when a person pays, say, seven dollars for a pair of shoes he does not look upon the cost of the pair of shoes as a burden imposed on him by the merchant who sells him the shoes. Since he has freedom of choice in the expenditure of his seven dollars, and the shoes presumably mean more to him than any alternative want he might be able to satisfy by spending his seven dollars either now or later, he feels he has benefited, as an individual, in the purchase of his shoes.

Not so in the case of taxes. Their payment does not rest on the voluntary choice of the taxpayer, who usually is not aware of any personal gain in return for the payment of taxes. To tell him that he derives social or collective benefits from the expenditure of a part of his income by a governmental agency sounds too theoretical and academic to have any practical significance for him.

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And yet it is these collective benefits which we, as members of organized society, derive from the many services of government, which should be borne in mind when we pay taxes, whether locally or to the Federal Government. Local benefits, paid for with our tax dollars, are not particularly difficult to observe. They range from garbage removal and street cleaning to public school education and police protection. If taxpayers were to take the time to estimate what they would have to pay for these services, individually, which they are privileged to enjoy together with other members of the community, they would soon discover that they are getting a substantial bargain.

But undoubtedly there are those who feel that they, as individuals, would benefit more if they were free to spend their tax dollars as they saw fit rather than be compelled to pay for "bargains" which they don't want. Such a point of view implies that persons, left free to dispose of their income, would put it to better use than if it were spent for them in part, by the government for seemingly intangible benefits to them. This raises the all-important question as to who is to judge what is "better":—voluntary choice in disposing of one's income, or compulsory sharing through governmental action. If we would seek to give a fair answer to this question, we would have to admit that in our modern complex social structure there is a growing field of collective or communal needs, which can be met more economically as well as more equitably by public spending of tax dollars rather than leaving it to individual preference and choice.

The providing of a cesspool and the digging of a well may be left to the choice of individuals in rural areas, to be paid for by them as they see fit. But it would obviously lead to tragic consequences to allow individuals in a densely populated urban area to decide for themselves how to provide these utilities.

It involves considerable public expenditures of tax dollars to meet the modern communal requirements for sanitation, health protection, welfare and recreational facilities, educational opportunities and protection of person and property. These services are not free, they have to be paid for by someone, and it is "the burden of taxes" that makes possible rendering them. If they had to be paid for on an individual basis their costs would become prohibitive to the large majority of the members of the community. And without these services we would be inviting anarchy and chaos.

Although it is not particularly difficult to demonstrate the benefits accruing to individuals as members of the community, from local governmental expenditures of tax dollars, the issue becomes somewhat more hazy when we consider the mounting burden of Federal taxes and the alleged social benefits derived from their expenditure. Undoubtedly Federal taxes have absorbed an increasing percentage of the national income in recent years. It is common knowledge that the primary reason for the increasing "burden" of Federal taxes is war,—past, present, and future. Long before we had completed paying for the money costs of the first World War, we were saddled with the costs of World War II. Nor should we forget that the depression of the thirties, calling for large expenditures of public funds, derived from both current and anticipated tax dollars (euphoniously called deficit spending) had its roots in the economic dislocations growing out of the first World War. Once the present war is over, we will not only continue to meet war costs with tax dollars, but may also be paying taxes to prepare for the next war, since there is little if any historical evidence to show that peacetime national armaments, avowedly for purposes of defense, are a preventive of war.

If, therefore, we could eliminate the costs of war and preparation for war from the budgets of governments, primarily the Federal budget, we would discover the "burden of taxes" would be considerably lighter.

In 1929 Federal taxes per family of four amounted to \$132, while in 1933 they had declined to \$68. Conservative estimates by the Research Committee of the Committee for Economic Development place postwar Federal taxes at \$512 per family annually. But less than one-fourth of this tax load would be for ordinary government expenses, including regular public works. More than three-fourths of the total would be in payment of war costs, including veterans' pensions and interest on public debt, arising chiefly out of wartime borrowing. No provision is made in these estimates of postwar taxes of over \$500 per family for reduction of the Federal debt.

If we fully appreciated the collective peacetime benefits that could be derived from the expenditure of only a fractional part of the tax dollars we are now spending for war, we might be inclined to change our attitude toward the payment of taxes somewhat, even though we could not be brought to looking upon taxpaying as a privilege rather than as a burden.



The ultimate test as to whether taxes are either a "burden" or a "relief" must rest upon a careful balancing of costs against gain. Unfortunately, most people look only at the cost or sacrifices to them when they pay taxes. A more realistic approach to the problem of taxes suggests the careful weighing of governmental expenditures against governmental services, and assuming our full responsibility in our democracy of seeing to it that we get a dollar's worth of collective services for every tax dollar spent for us by the Government. Then we may discover that the burden of taxes is not as unreasonable as we have been led to believe.

While this brief article has dealt with the nature and functions of taxes, a subsequent article will be devoted to a consideration of the sources and effects of taxes on the functioning of our economy.

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**Antagonism of *p*-Aminobenzoic Acid to Sulphonamides in Higher Plants and Fungi.** P. W. Brian. *Nature, Lond.* 153, 83 (1944); through *Quart. J. Pharm. & Pharmacol.* 17, 137 (1944). *p*-Aminobenzenesulfonamide in a concentration of 0.01 per cent was applied to wheat grains and was found to reduce the emergence of plantlets and to stunt their growth. Grains which were soaked in an aqueous solution of the drug prior to planting in sand showed a stunting of the coleoptile and roots. The addition of *p*-aminobenzoic acid and was observed to prevent this effect.

A similar delaying action was noted on the growth of *Penicillium digitatum* grown in Petri dishes. Small amounts of *p*-aminobenzoic acid overcame this delay.

These results, coordinated with the competitive inhibition of an enzyme reaction, suggest that *p*-aminobenzoic acid may be associated with some metabolic processes which are of fundamental importance to living matter.

## SELECTED ABSTRACTS

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**Oral Administration of Penicillin in Oil.** R. L. Libby. *Science* 101, 178 (1945). Preliminary experiments on the oral administration of enteric coated penicillin tablets to dogs confirmed the observations of other investigators that satisfactory blood levels of the drug could not be obtained.

Since little if any splitting of fats occurs in the stomach, it was believed that solutions or dispersions of penicillin in fats or oils might prove sufficiently stable to be of therapeutic value.

Solutions of penicillin acid in oil were found to lose activity rapidly at room temperature. Suspensions or dispersions of the sodium, calcium, magnesium and ammonium salts in various oils were found, however, to be stable at room temperature for two or three months.

Suspensions in cottonseed oil of the sodium or calcium salts of penicillin, 150 to 300 units per mgm., were encapsulated in gelatin; each capsule contained 10,000, 25,000 or 50,000 units. Studies were made on the blood and urinary levels of penicillin over an eight-hour period following the oral administration to an 86 kilogram man of a cottonseed oil suspension of approximately 90,000 units of penicillin sodium. The first urine sample, collected 25 minutes after administration of the drug, contained about 0.4 unit of penicillin per ml.; a maximum value of over 7 units per ml. was noted during the first two hours. A rather abrupt decrease occurred during the next two hours, but thereafter the drop was more gradual, reaching the figure of 1.8 units per ml. at the end of eight hours.

Blood levels of approximately 0.05, 0.04, 0.04, 0.02 and zero units of penicillin per ml. were observed after one, two, four, six and eight hours. Analysis of published clinical data indicates that the blood level of penicillin usually maintained is from 0.03 to 0.06 unit per ml. It would thus appear that a single oral dose of penicillin in oil will maintain a fairly uniform therapeutic blood level of the drug for at least four hours.

A comparison of this data with that reported by other authors on the blood levels noted following the intramuscular injection of an

aqueous solution of penicillin indicates that two, three or even more such injections would be necessary to maintain a comparable concentration of the drug in the blood.

Further experiments on penicillin in oil indicated that optimum blood levels of the drug are obtained when such a dispersion is administered on an empty stomach.

Although greater amounts of penicillin are likely to be required for oral use than for intramuscular injection, this disadvantage may be offset by the greater ease of the former mode of administration, together with the possibility that a less highly purified product may be satisfactory for this route.

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**Antibacterial Values of Ethylene Glycol Monophenyl Ether (Phenoxetol).** H. Berry. *Lancet* 2, 175 (1944); through *U. S. Nav. Med. Bull.* 43, 888 (1944). Ethylene glycol monophenyl ether, for which the name "phenoxetol" is suggested, was found to possess marked bacteriostatic and bactericidal activity against *Ps. pyocyanea*.

Penicillin, the acridine compounds, the quaternary ammonium compounds and the sulfonamides have low bacteriostatic values against this organism; and since phenoxetol was found to be compatible with these substances, the authors suggest that it may be used in conjunction with them in the treatment of pyocyanea infection in wounds.

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**Clinical Use of Phthalylsulfathiazole.** E. J. Poth and C. A. Ross. *J. Lab. & Clin. Med.* 29, 785 (1944); through *U. S. Nav. Med. Bull.* 43, 1066 (1944). The qualitative effects of phthalylsulfathiazole and succinylsulfathiazole are quite similar, but quantitatively the former drug possesses approximately twice the antibacterial activity of the latter.

The administration of phthalylsulfathiazole may be advantageous in cases where the patient has a diarrhea such as is occasionally observed in the presence of malignancies of the cecum and ascending colon, and also when it is desired to clear the bowel by purgation.

**Penicillin Pastilles.** L. L. Martin. *Pharm. J.* 99, 231 (1944). Encouraging results in the treatment of acute ulcerative gingivostomatitis (Vincent's type) and acute hemolytic streptococcal tonsillitis, including scarlet fever, have been obtained in clinical trials of pastilles containing penicillin sodium.

The following formula, sufficient for 200 pastilles, was found satisfactory: gelatin (in powder), 440 grains; Nipagin M,  $2\frac{1}{2}$  grains, syrup, distilled water, of each 2 fluid ounces. Nipagin M is necessary if a quantity of the base is kept on hand, although pastilles containing penicillin sodium showed no deterioration after storage for three months.

The method of preparation is as follows:

1. Dissolve the Nipagin M in the water, previously heated to boiling, and add the syrup.
2. Transfer to a water-bath; add the powdered gelatin with stirring, continuing the heat until dissolved.
3. Lubricate the pastille mold with almond or persic oil, and pour in the melted base to a depth of 0.5 cm. A pastille with a surface area of 1 sq. cm. and a thickness of 0.5 cm. was found to be the most satisfactory. It was found convenient to use a mold which was 10 cm. x 10 cm. and 2 cm. deep.
4. Stir the melted base continuously with a glass rod until a temperature of 43° C. is registered on a thermometer placed in the liquid.
5. Add the required volume of penicillin sodium solution, and distribute it by stirring. The quantity of penicillin solution of a concentration of 10,000 units per mil required for 100 pastilles is 2.5 or 5 mls, yielding, respectively, 250 or 500 units per pastille.
6. Set aside to cool.
7. When the mass has completely set, transfer it to a sheet of white demy paper lubricated with persic oil.
8. Divide it into 100 pastilles.
9. Pack the pastilles in tins. Sixteen pastilles constitute the average daily requirement of a single patient.

**Sodium Dilantin Gingival Hyperplasia.** H. L. Esterberg and P. H. White. *J. A. D. A.* 32, 16 (1945). The observation over a three-year period of 244 epileptic patients who received treatment with dilantin sodium revealed that gingival hyperplasia occurred in 54 per cent of the cases. The extent of the reaction to the drug appeared to be attributable to the individual sensitivity to it, rather than to age, sex, length of treatment or size of dosage.

In the initial stage the interdental papillæ became slightly inflamed, followed by a pinhead tissue extrusion. In an advanced stage, pendulated, lobulated papillæ were present, often bleeding easily on brushing or eating. With the exception of open bite, which was present in 7.7 per cent of the cases, local conditions had little influence on the incidence or severity of the reaction.

The incidence of dental caries was surprisingly low, especially since the patients were from an underprivileged group; 23 per cent were free of caries, and only 15 per cent had extreme caries (more than three cavities).

Treatment of the reaction involved the surgical removal of the hyperplastic tissue under local anesthesia, the choice being procaine with epinephrine 1:60,000. As a group the epileptic patients did not react well to this anesthesia; procaine acted as a convulsant, and a sensitivity to epinephrine was noted.

The excised tissue was demonstrated to be non-malignant by transplanting small bits of it directly into the anterior chamber of the eye of guinea-pigs. At the end of six weeks the transplants disappeared completely.

Routine brushing and massage tended to retard the development of hyperplastic tissue, but practically all of the cases experienced an eventual recurrence of the condition unless dilantin sodium therapy was discontinued.

At present, no other tissue in the body is known to react to the use of this drug.

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Rocky Mountain spotted fever is indeed a misnomer since today it is common on the Atlantic seaboard. Its early diagnosis is essential for effective treatment. The similarity in symptoms of typhus fever and the observation that para-aminobenzoic acid is useful in typhus makes study of its action in Rocky Mountain spotted fever of decided interest.

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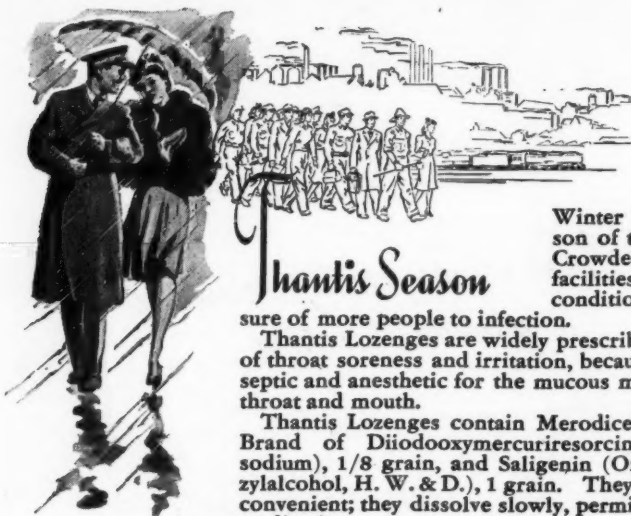
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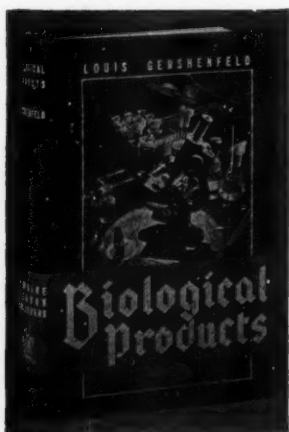
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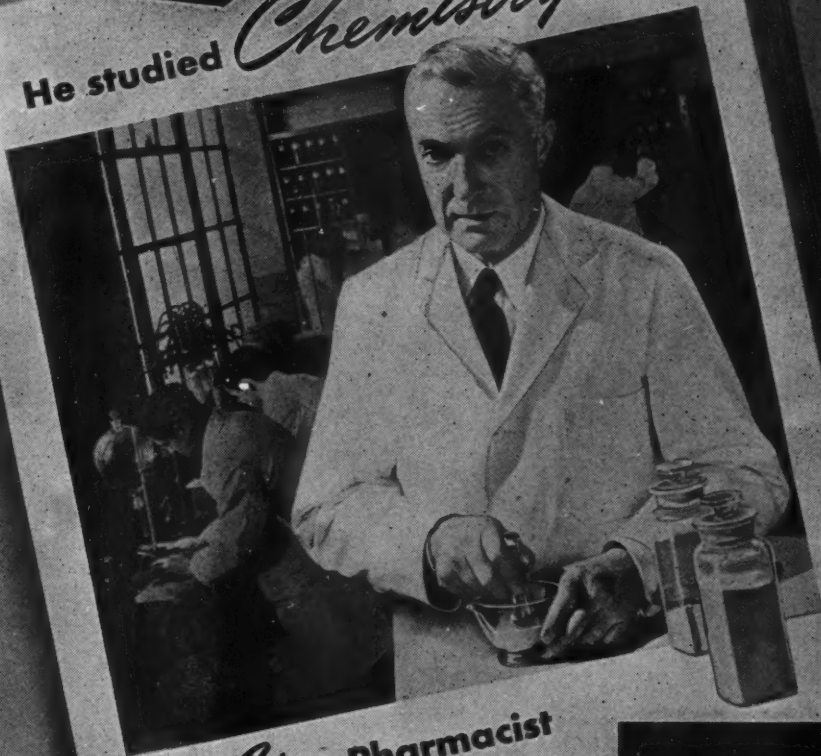
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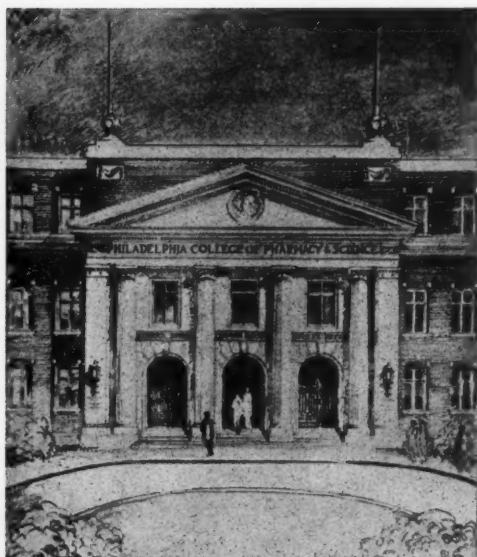
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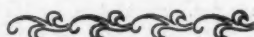


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